

REMARKS

Claims 1-3 and 6-11 were previously canceled. Claim 4, 5, and 12 are pending. Applicants respectfully request that the Examiner reconsider this application in view of the following remarks.

The Examiner rejects for obviousness under 35 U.S.C. § 103 (1) claims 4 and 12, relying on Greig, U.K. Patent Application Publication 2,276,584 (Greig) and Kile et al., U.S. Patent 4,093,004 (Kile); and (2) claims 4 and 5, relying on Greig and Foglia et al., U.S. Patent 3,560,291 (Foglia). It appears to be the Examiner's position that these three references together disclose or suggest all of the limitations recited in claims 4, 5, and 12. See the Office Action, page 2, line 18 through page 4, line 11. Applicants do not agree and will discuss independent claim 12 first.

Claim 12 covers a method of assembling multilayer tapes. The method includes (1) sequentially winding around an unoriented plastic tubular support two tapes, each of which contains (i) a transparent/oriented layer and (ii) a radiation-absorbing layer (i.e., a layer partially absorbing radiation energy), and (2) applying electromagnetic radiation to the thus-obtained tubular support. In other words, claim 12 requires a unique tape structure, i.e., each tape containing two layers -- a transparent/oriented layer and a radiation-absorbing layer.

Greig, the primary reference, teaches applying transparent or radiation-absorbing layers onto a plastic tubular support. See the abstract and page 11, lines 6-9. It states that “[t]he pipe 10 shown in Figure 1 has been wound with the tapes 12, 14 using a machine ...” See page 7, lines 16-17. Figure 1 shows that each of tapes 12 and 14 contains only a single layer. Thus, Greig discloses assembling multiple tapes, each containing only one layer. Nowhere in Greig is use of multilayer tapes taught, let alone the unique tape structure required by claim 12, i.e., each tape containing two layers -- a transparent/oriented layer and a radiation-absorbing layer.

Of note, using the unique multilayer tapes as required by claim 12 leads to an advantage not provided by the Greig method. To prevent overheating or degradation of layers, Greig teaches at page 11, lines 10-14 that “the amount of pigment or other

absorber used [in layers] is ideally adjusted to create simultaneously the fusion temperature at each of the interfaces.” Thus, the Greig method requires careful control of transparency of each layer. By contrast, in the tape-wound tubular support prepared by the method of claim 12, the radiation-absorbing layer in a tape, upon radiation, partially absorbs energy and its temperature increases, while the transparent/oriented layer in the same tape does not absorb radiation energy and its temperature remains low. When the radiation-absorbing layer in a tape reaches the fusion temperature, it forms fusion bonding with its adjacent surface, causing the tape to adhere to that surface while the temperature of the transparent/oriented layer in the same tape remains low. By this approach, overheating or degradation of the transparent/oriented layer is prevented without the need to control the transparency of this layer.¹ Thus, the claimed method is advantageous over the Greig method.

In sum, contrary to the Examiner’s belief, Greig does not teach or suggest using multilayer tapes, let alone the unique tape structure required by claim 12, i.e., each tape containing two layers -- a transparent/oriented layer and a radiation-absorbing layer.

Kile and Foglia do not cure this deficiency. Kile teaches applying an oriented polymer layer onto a pipe to enhance reinforcement and Foglia teaches using laser radiation to bond thermoplastic films. Neither Kile nor Foglia mentions using multilayer tapes.

As each of Greig, Kile, and Foglia fails to teach or suggest using multilayer tapes, let alone the unique array of the layers required by claim 12, i.e., each tape containing two layers -- a transparent/oriented layer and a radiation-absorbing layer, any combination of these three references also fails to do so. In other words, claim 12 is not rendered obvious by Greig, Kile, and Foglia, either taken alone or in combination.

For the same reasons set forth above, claims 4 and 5, which both depend from claim 12, are also not rendered obvious by these three references.

¹ Although this advantage is not recited in claim 12, it flows from practicing the claimed invention and should be taken into consideration to comply with the guideline set forth in MPEP 716.02(f), which states “evidence and arguments directed to advantages not disclosed in the specification cannot be disregarded.”

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CONCLUSION

In view of the above remarks, Applicants submit that the rejection raised by the Examiner has been overcome and claims 4, 5, and 12, as pending, define patentable subject matter over the cited references. It is therefore requested that the Examiner allow this application.

Please apply any other charges or credits to Deposit Account No. 50-4189, referencing Attorney Docket No. 69701-003US1.

Respectfully submitted,

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